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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/890,482	05/02/2003	Andrew J. Onderkirk	53852US013	1699
32692	7590	11/19/2003	EXAMINER	
3M INNOVATIVE PROPERTIES COMPANY PO BOX 33427 ST. PAUL, MN 55133-3427			BOUTSIKARIS, LEONIDAS	
			ART UNIT	PAPER NUMBER
			2872	

DATE MAILED: 11/19/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/890,482	OUDERKIRK ET AL. <i>MW</i>
	Examiner	Art Unit
	Leo Boutsikaris	2872

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 02 May 2003.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-27 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 02 May 2003 is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All
 - b) Some *
 - c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 13) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
 - a) The translation of the foreign language provisional application has been received.
- 14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- | | |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ . |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>11</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

In view of the papers filed on July 26, 2001, it has been found that this nonprovisional application, as filed, through error and without deceptive intent, improperly set forth the inventorship, and accordingly, this application has been corrected in compliance with 37 CFR 1.48(c). The inventorship of this application has been changed by adding the names of Michael F. Weber, John A. Wheatley, and Roger J. Strharsky.

Priority

Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d). The certified copy has been filed in parent Application No. PCT/US99/01818, filed on 1/28/1999.

Specification

The abstract of the disclosure is objected to because "515575 nm" should be replaced by "515-575 nm". Correction is required. See MPEP § 608.01(b).

Claim Objections

Claims 3, 5, 15, 25 are objected to because of the following informalities:

In claim 3, line 3, "of" should be deleted for better clarity.

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In claim 5, lines 3-4, the phrase “which can transmit through the dielectric reflective layer” should be replaced by “which is transmitted through the dielectric reflective layer” for better clarity.

In claim 15, line 2, and claim 25, line 2, “coatings” should be replaced by “coating”.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-3 are rejected under 35 U.S.C. 102(b) as being anticipated by Arends (US 5,360,659).

Regarding claim 1, Arends discloses an optical filter (Fig. 1) comprising a dielectric reflective layer capable of reflecting a predetermined proportion of light in a specific wavelength region, i.e., near infrared, while transmitting a predetermined proportion of light in the visible region i.e., between 430 and 790 nm (see Fig. 3), the dielectric reflective layer comprising a first set of dielectric reflective layer units, constituted by a plurality of layers each formed of a first polymer A, in combination with a second set of dielectric reflective layer units constituted by a plurality of layers each formed of a second polymer B having a refractive index different from the first polymer, the first and second sets of dielectric reflective layer units being combined by alternatively stacking the first and second polymer layers, A and B, the dielectric reflective layer

having a reflectance of not less than 70% of the light to be reflected (wavelengths in the 1,200-2,000 nm region), and transmittance of no less than 60% in the visible region (lines 2-6, col. 4, and 4-10, col. 7).

Regarding claim 2, the polymeric layers A and B comprising the stack of reflective layers of the optical filter are quarter wavelength layers, i.e., the product of the layer refractive index and the layer thickness is equal to one fourth of the reflected light (see line 49, col. 5 to line 3, col. 6, wherein it is taught that for the first order reflected infrared light, for normal incidence, the wavelength is given by the equation in line 60 of col. 5, which is equivalent with the equation given in line 11, p. 7, of the disclosure).

Regarding claim 3, a quarter-wavelength layer reflects in the IR range including the 800-1,000 nm, which is equivalent to the product $n \times d$ being in the range of 200-250 nm. Furthermore, in one embodiment, the reflectance in the 770-2,000 nm region is at least 80% (lines 1-6, col. 4).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 4-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arends (US 5,360,659) in view of Kawamoto (US 5,982,546).

Regarding claim 4, Arends discloses all the limitations of the above claim except for showing a resin layer containing a fluorine polymer disposed on a surface of the dielectric reflective layer. Kawamoto discloses a reflective multi-layer filter (Fig. 3), wherein it is taught that a transparent protective layer may be provided on one side of the polymeric film which faces the incident light (see Fig. 2 and lines 11-30, col. 12). The protective layer may comprise fluorine polymer resins. It would have been obvious to one of ordinary skill in the art at the time the invention was made to protect the reflective filter of Arends with a transparent fluorine resin polymeric layer, as taught by Kawamoto, for improving the light resistance, gas resistance, and water proofness of the IR reflective filter of Arends (see lines 16-18, col. 12 in Kawamoto).

Regarding claim 5, the protective layer is made of such thickness that it is maintaining the light reflectivity at the visible wavelengths, i.e., it comprises a quarter-wavelength layer having the product of $n \times d$ equal to the wavelength of the reflected visible light (see lines 32-36, col. 12 in Kawamoto).

Claims 6-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arends (US 5,360,659) in view of Klocek (US 6,160,661) and Isoda (US 3,928,760).

Regarding claim 6, Arends discloses all the limitations of the above claim except for teaching that the IR reflective filter is used in conjunction with an IR detector device and that the filter is curved. Klocek discloses a protective window 10 positioned in front of an IR detector/sensor, the protective window 10 comprising multi-layer optical filters, which are curved (see Fig. 2 and lines 36-46, col. 3). Isoda discloses a remote control device, which includes an optical filter 14 in front of the optical detector 15 (Fig. 3). The role of the optical

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filter is to prevent passage of light of unwanted wavelengths. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the IR reflective filter of Arends as a protective shield for an IR sensor, as taught by Klocek, for protecting against external degrading factors, which may include unwanted EM radiation and IR radiation interference noise, as taught by Isoda. A curved-shaped filter provides a greater flexibility in covering the most possible sensor area.

Regarding claims 7, 10, the curved shape of the filter disclosed by Klocek is cylindrical, the detector is positioned at the center of the arc defining the filter (see Fig. 2), and because of its shape, it provides a wide viewing angle in one plane (plane of paper) and limited in the orthogonal plane.

Regarding claim 8, Klocek does not specify that the shape of the protective filter is spherical. It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the shape of the protective filter of Klocek spherical, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ (CCPA 1980). Here, the effective variable is the shape of the protective filter 10, and a spherical-shaped filter substantially enclosing an IR sensor, provides the maximum protection against external interference for the case of omnidirectional IR sensors.

Regarding claim 9, it is noted that the combination of Arends in view of Klocek and Isoda reads on all of the limitations of the claim, since the claim language “to accommodate spectral shift” is functional language, and it has been held that claims directed to apparatus must be distinguished from the prior art in terms of structure rather than function. *In re Danley*, 120

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USPQ 528, 531 (CCPA 1959). Furthermore, it has been held that “apparatus claims cover what a device is, not what a device does” (emphasis in original) *Hewlett-Packard Co. v. Bausch & Lomb Inc.*, 15 USPQ2d 1525, 1528 (Fed. Cir. 1990).

Claims 11-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arends (US 5,360,659) in view of Lechter (US 5,101,139) and Okamura (US 6,104,530).

Regarding claims 11-12, Arends discloses all the limitations of the above claims except for showing a metallic mesh coated on the surface of the dielectric reflective film. Lechter discloses a flat panel display, which includes a metallic transparent mesh 19 (Fig. 1, 6, and lines 55-58, col. 2 and 37-41, col. 6). Lechter teaches that the metallic mesh prevents the passage of electric fields (lines 6-9, col. 2). It would have been obvious to one of ordinary skill in the art at the time the invention was made to include a metallic mesh disposed on the dielectric filter of Arends, as taught by Lechter, for preventing the passage of spurious deleterious electric fields through the protecting filter and onto the IR sensor.

Furthermore, Arends does not specify that the metallic mesh is coated on the filter, wherein the coating method may be vapor deposition or sputtering. Okamura discloses a laminate optical filter used in conjunction with a flat display, wherein it is taught that the laminated metal films are formed by various film-forming coating techniques, including sputtering (lines 45-50, col. 11). It would have been obvious to one of ordinary skill in the art at the time the invention was made to form the metallic mesh in the laminate filter of Arends by sputtering coating, since this coating method allows for easy control of the film thickness (lines 45-47, col. 11 in Okamura).

Regarding claim 13, the dielectric multi-layer film is disposed on substrate 17 (see Fig. 1 in Arends).

Regarding claim 14, Arends teaches that the IR reflecting laminate filter may be disposed on glass substrate (lines 63-65, col. 1).

Regarding claim 15, Arends in view of Klocek and Isoda does not disclose the use of an AR coating on one surface of the substrate. Lechter discloses that the laminate optical filter used includes an AR coating on an end face (lines 51-54, col. 2). It would have been obvious to one of ordinary skill in the art at the time the invention was made to dispose an AR coating on an end face of the reflective filter of Arends, e.g., on a surface of the substrate, for eliminating the deleterious effects of light being reflected from substrate surface and affecting the interference properties of the dielectric interference filter layers.

Regarding claims 16, 19, Lechter discloses that the conductive metallic mesh is grounded (lines 38-39, col. 6), and Fig. 6 shows that the metallic mesh is in contact with the peripheral edges of the filter substrate.

Regarding claims 17-18, Lechter does not specify the type of the conductive, metallic mesh used in conjunction with the optical filter for shielding electric fields. It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the mesh from copper, since it has been held that to be within the general skill of a worker in the art to select a known material on the basis of its suitability for its intended use. *In re Leshin*, 125 USPQ 416. Copper has excellent conductive properties and it is reasonably economical.

Claims 20, 22-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arends (US 5,360,659) in view of Klocek (US 6,160,661) and Isoda (US 3,928,760) and further in view of Lechter (US 5,101,139) and Okamura (US 6,104,530).

Regarding claims 20, 22, Arends in view of Klocek and Isoda discloses all the limitations of the above claims except for showing a metallic mesh coated on the surface of the dielectric reflective film. Lechter discloses a flat panel display, which includes a metallic transparent mesh 19 (Fig. 1, 6, and lines 55-58, col. 2 and 37-41, col. 6). Lechter teaches that the metallic mesh prevents the passage of electric fields (lines 6-9, col. 2). It would have been obvious to one of ordinary skill in the art at the time the invention was made to include a metallic mesh disposed on the dielectric filter of Arends in view of Klocek and Isoda, as taught by Lechter, for preventing the passage of spurious deleterious electric fields through the protecting filter and onto the IR sensor. It is noted that the existence of a radiation source emitting radiation in an undesired wavelength range is inherent in the apparatus of Arends in view of Klocek and Isoda, since the IR sensor picks up radiation of many EM radiation sources in its vicinity, thus requiring the use of the reflective IR filters.

Furthermore, Arends in view of Klocek and Isoda and further in view of Lechter does not specify that the metallic mesh is coated on the filter, wherein the coating method may be vapor deposition or sputtering. Okamura discloses a laminate optical filter used in conjunction with a flat display, wherein it is taught that the laminated metal films are formed by various film-forming coating techniques, including sputtering (lines 45-50, col. 11). It would have been obvious to one of ordinary skill in the art at the time the invention was made to form the metallic

mesh in the laminate filter of Arends by sputtering coating, since this coating method allows for easy control of the film thickness (lines 45-47, col. 11 in Okamura).

Regarding claim 23, the dielectric multi-layer film is disposed on substrate 17 (see Fig. 1 in Arends).

Regarding claim 24, Arends teaches that the IR reflecting laminate filter may be disposed on glass substrate (lines 63-65, col. 1).

Regarding claim 25, Arends in view of Klocek and Isoda does not disclose the use of an AR coating on one surface of the substrate. Lechter discloses that the laminate optical filter used includes an AR coating on an end face (lines 51-54, col. 2). It would have been obvious to one of ordinary skill in the art at the time the invention was made to dispose an AR coating on an end face of the reflective filter of Arends, e.g., on a surface of the substrate, for eliminating the deleterious effects of light being reflected from substrate surface and affecting the interference properties of the dielectric interference filter layers.

Regarding claims 26-27, Lechter discloses that the conductive metallic mesh is grounded (lines 38-39, col. 6), and Fig. 6 shows that the metallic mesh is in contact with the peripheral edges of the filter substrate.

Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Arends (US 5,360,659) in view of Klocek (US 6,160,661) and Isoda (US 3,928,760) and further in view of Lechter (US 5,101,139) and Okamura (US 6,104,530) and further in view of Woodruff (6,469,685).

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Arends in view of Klocek and Isoda and further in view of Lechter and Okamura disclose all the limitations of the above claims except for specifying that one source for unwanted IR radiation being blocked by the reflective filter of Arends is a plasma display device. Woodruff discloses a display panel filter (Fig. 1) and he teaches that plasma display devices emit IR radiation, which may interfere with the operation of a remote control device (lines 53-57, col. 1). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the IR blocking filter of Arends in conjunction with a remote control device for blocking radiation from a plasma display device, as taught by Woodruff, for achieving better performance of the IR radiation signaling utilizing remote device.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Mellor (US 4,931,315) and Perilloux (US 4,896,928) disclose IR reflecting multi-layer filters comprising metal containing oxides, wherein visible wavelengths are transmitted and the reflectance over the near IR range is at least 70%.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dr. Leo Boutsikaris whose telephone number is 703-306-5730 (will be changed to 571-272-2308 after 1/20/2004).

Leo Boutsikaris, Ph.D.
Patent Examiner, AU 2872
November 14, 2003

